REMARKS

I. INTRODUCTION

Claims 1, 15 and 29 have been amended above, support being found in the originally filed specification and drawings (see, e.g., Specification, para. [0035] and Fig. 6). Claims 1-9, 11-23, 25-37, 39-48 and 52-54 are currently under consideration in the above-referenced application. Provided above, please find a claim listing indicating the amendments to claims 1, 15 and 29 on separate sheets so as to comply with the requirements set forth in 37 C.F.R. § 1.121. It is respectfully submitted that no new matter has been added.

II. REJECTIONS UNDER 35 U.S.C. 103(a) SHOULD BE WITHDRAWN

Claims 1, 3, 6-9, 11-13, 15, 17, 20-23, 25-27, 29, 31, 34-37, 39-41, 43-48 and 52-54 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,016,047 issued to Notten et al. (the "Notten Patent"), in view of U.S. Patent No. 6,433,517 issued to Sakakibara et al. (the "Sakakibara Patent"). Claims 2, 4, 14, 16, 18, 28, 30, 32 and 42 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the Notten Patent and the Sakakibara Patent, further in view of U.S. Patent No. 5,767,659 issued to Farley (the "Farley Patent"). Claims 5, 19 and 33 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over the Notten Patent, the Sakakibara Patent and the Farley Patent, further in view of U.S. Patent No. 5,889,385 issued to Podrazhanzky et al. (the "Podrazhanzky Patent"). Claims 14, 28 and 42 stand rejected under 35 U.S.C. § 103(a) as allegedly being also unpatentable over the Notten Patent and the Sakakibara Patent, further in view of U.S. Patent No. 6,188,202 issued to Yagi (the "Yagi Patent"). Applicant respectfully submits that the alleged combination of the Notten Patent and the Sakakibara Patent, taken alone or in combination with the Farley Patent, the Podrazhanzky Patent and/or the Yagi Patent, fails to teach, suggest or disclose the subject matter recited in

amended independent claims 1, 15 and 29, and the claims which depend therefrom. Thus, it is respectfully requested that the 35 U.S.C. § 103(a) rejections of these claims be withdrawn for at least the reasons set forth herein below.

"To reject claims in an application under Section 103, an examiner must show an unrebutted *prima facie* case of obviousness." *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998). The Supreme Court in *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966), stated:

> Under Section 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined.

Indeed, to sustain a rejection under 35 U.S.C. § 103(a), there must be some teaching, other than the instant application, to alter the prior art to arrive at the claimed invention. "The problem confronted by the inventor must be considered in determining whether it would have been obvious to combine the references in order to solve the problem." *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 679 (Fed. Cir. 1998).

The objective standard for determining obviousness under 35 U.S.C. § 103, as set forth in *Graham v. John Deere, Co.*, 383 U.S. 1 (1966), requires a factual determination to ascertain: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; and (3) the differences between the claimed subject matter and the prior art. Based on these factual inquiries, it must then be determined, as a matter of law, whether or not the claimed subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the alleged invention was made. *Graham*, 383 U.S. at 17. Courts have held that there must be some suggestion, motivation or teaching of the desirability of making the combination claimed by the applicant (the "TSM test").

See In re Beattie, 974 F.2d 1309, 1311-12 (Fed. Cir. 1992). This suggestion or motivation may be derived from the prior art itself, including references or disclosures that are known to be of special interest or importance in the field, or from the nature of the problem to be solved. *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573 (Fed. Cir. 1996).

Although the Supreme Court criticized the Federal Circuit's application of the TSM test, *see KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741, (2007) the Court also indicated that the TSM test is not inconsistent with the *Graham* analysis recited in the *Graham v. John Deere* decision. *Id.*; *see In re Translogic Technology, Inc.*, No. 2006-1192, 2007 U.S. App. LEXIS 23969, *21 (October 12, 2007). Further, the Court underscored that "it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *KSR*, 127 S. Ct. at 1741. Under the precedent established in *KSR*, however, the presence or absence of a teaching, suggestion, or motivation to make the claimed invention is merely one factor that may be weighed during the obviousness determination. *Id.* Accordingly, the TSM test should be applied from the perspective of a person of ordinary skill in the art and not the patentee, but that person is creative and not an automaton, constrained by a rigid framework. *Id.* at 1742. However, "the reference[s] must be viewed without the benefit of hindsight afforded to the disclosure." *In re Paulsen*, 30 F.3d 1475, 1482 (Fed. Cir. 1994).

The prior art cited in an obviousness determination should create a reasonable expectation, but not an absolute prediction, of success in producing the claimed invention. *In re O'Farrell*, 853 F.2d. 894, 903-04 (Fed. Cir. 1988). Both the suggestion and the expectation of success must be in the prior art, not in applicant's disclosure. *Amgen, Inc. v. Chugai Pharmaceutical*

Co., Ltd., 927 F.2d 1200, 1207 (Fed. Cir. 1991) (citing *In re Dow Chem. Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988)). Further, the implicit and inherent teachings of a prior art reference may be considered under a Section 103 analysis. *See In re Napier*, 55 F.3d 610, 613 (Fed. Cir. 1995).

Secondary considerations such as commercial success, long-felt but unsolved needs, failure of others, and unexpected results, if present, can also be considered. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538-39 (Fed. Cir. 1983). Although these factors can be considered, they do not control the obviousness conclusion. *Newell Cos. v. Kenney Mfg. Co.*, 864 F.2d 757, 768 (Fed. Cir. 1988).

To establish obviousness, the prior art references must be evaluated as a whole for what they fairly teach and neither the references' general nor specific teachings may be ignored. *Application of Lundsford*, 357 F.2d. 385, 389-90 (CCPA 1966). A reference must be considered for all that it teaches, not just what purportedly points toward the invention but also that which teaches away from the invention. *Ashland Oil, Inc. v. Delta Resins & Refractories*, 776 F.2d. 281, 296 (Fed. Cir. 1985).

The Notten Patent relates to a battery management system which includes input means for receiving input signals representative of a physical quantity of a battery and processing means for calculating at least one physical quantity of the battery at least partially based on the input signals and a battery temperature; and for generating an output signal derived from the calculated physical quantity. The Notten Patent also describes a battery charger/discharger including a battery management system. (See Notten Patent, Abstract). As described in the Notten Patent, the battery management system 100 of Fig. 2 controls the battery charger 200 by maintaining the battery temperature substantially at a predetermined temperature curve. In a simple form, the battery

temperature is maintained at a constant temperature of, for instance, 30°C. Alternatively, the battery temperature is maintained at a predetermined offset, for instance 10°C., related to the ambient temperature. (See *id.*, col. 26, lns. 6-17).

The described simulation tool of the Notten Patent can be used to design an optimum temperature curve for a specific application and operating environment. It will be appreciated that any conventional control loop may be used to control the battery charger 200 in such a way that the battery temperature substantially matches the predetermined temperature curve. The current or voltage level supplied by the battery charger 200 may be controlled by the control loop. Alternatively, the battery charger 200 may use a pulsed-voltage or pulsed-current charging scheme, where the control loop controls, for instance, the pulse duration and/or pulse shape. Obviously also suitable combinations of the charging schemes may be used. The battery management system 100 uses the calculated battery temperature for accurately controlling the battery charger 200. It will be appreciated that in a simple embodiment, the battery management system 100 may use a measured battery temperature to control the battery charger 200. (See *id.*, col. 26, lns. 18-35).

The Notten Patent further states that its Fig. 8a shows that the battery voltage increases at higher charging currents due to the higher potential drop. (See *id.*, col. 26, lns. 65-67; and Fig. 8a). The temperature development during charging is allegedly shown in Fig. 10a of the Notten Patent. The temperature becomes higher at higher currents. According to the Notten Patent, the strongest temperature rise occurs when the pressure starts to level off. This is due to the large heat contribution of the oxygen recombination reaction, which occurs at an overpotential of 1.2 V. (See *id.*, col. 27, lns. 30-35; and Fig. 10a).

The Sakakibara Patent relates "to a battery charger and a charging method suitable for charging a battery, such as a nickel metal hydride battery, which generates a large amount of heat during charging." (Sakakibara Patent, col. 1, lns. 12-17). "According to the battery charger and charging method described [in the Sakakibara Patent], charging current is controlled using a map for mapping an allowable value of current with which a battery can be charged while suppressing battery temperature from rising based on battery temperature and battery temperature rise." (*Id.*, col. 3, lns. 8-13). "The allowable value of current, with which the battery can be charged while suppressing the battery temperature from rising, is obtained. (*Id.*, col. 3, lns. 14-16). The battery is charged with the allowable current thus obtained." (*Id.*, col. 3, lns. 17-18).

A "map is provided [in the Sakakibara Patent] for variable-control of current and for specifying an optimum value of current which can be applied in order to avoid overheating battery." (See *id.* at col. 5, lns. 14-16, and Fig. 5). "If the battery temperature is low and the temperature rise is low (upper left on the map), a relatively high charging current is applied." (*Id.*, col. 5, lns. 26-28). However, it is "desirable to set a low current value on the left column on the map in order to avoid performance deterioration" since battery performance deteriorates if high current is discharged at low temperature. (See *id.* at col. 5, lns. 32-35, and Fig. 5).

Fig. 6 of the Sakakibara Patent shows a graph in which "the horizontal axis indicates charging time, whereas the vertical axis indicates charging current and battery temperature." (See *id.*, col. 6, lns. 18-20 and Fig. 6). According to the Sakakibara Patent, under certain conditions, "region I12 is selected and relatively high current of 4.5C, charging current (9A) is applied." (See *id.* at col. 8, lns. 5-10, and Fig. 6).

The Farley Patent relates to a battery pack including a component in which predetermined battery parameters definitive of a battery pack characteristic may be stored, together with a battery parameter sensor. (See *id.*, Abstract). The arrangement of the Farley Patent uses a processor that monitors cell temperature with time. For example, temperature measurements are logged at intervals such as each 5-10 seconds, and when a profile which matches a stored profile indicative of substantially full charge is identified, the transistor may be switched to shunt the charging current. The battery pack temperature may then rise due to the heat dissipated in a resistor R enabling the simple full charge detection by temperature of the battery charger to operate to end or shut-off the fast charge current in appropriate charger types. The processor of the Farley Patent may be arranged such that this overcharge protection occurs only when the temperature rise is due to the charging current (i.e. flow into the cells). (See *id.*, col. 5, lns. 35-51, and col. 19, lns. 50-60).

As shown in Fig. 8b of the Farley Patent, the cell temperature is read and stored so that a profile of cell temperature with time may be built up. If the cell temperature is within the range (step 89) for which fast charging is appropriate, then the cell temperature profile established to date is examined to see if the profile is equivalent to that of a full charged cell array (step 800). If not, after a pause of 1 minute and assuming the timer which has set the fast charging time limit before current shunting is to be applied has not expired (801), control loops back to a point label (a) where a portion of the aforesaid control regime is repeated. An outcome of this iteration is that repeated samples of cell temperature with time are stored and a profile built up which will eventually equate with the full charge profile (at step 800). An adjustment to the assumed charge state (i.e., 90% charged which is also known as profile) may be made to account for temperature. Whether full charge was reached or not, the current charge level, based on the charging which has occurred applied to the previously stored battery charge status, is displayed. At this point when the battery is

fully charged (at step 805), the current shunting transistor is switched on so that only a trickle current remains at the cell terminals. (See *id.*, col. 10, lns. 1-27; and Fig. 8b).

Independent claim 1, as amended herein, recites a battery charger configured to provide a temperature-regulated charging of a battery, comprising, *inter alia*:

> a processing arrangement operable to:
>
> (a) obtain a temperature data associated with the battery; and
>
> (b) apply a particular amount of a charge to the battery based on the temperature data of the battery, wherein the processing arrangement is configured to maintain the battery at a predetermined threshold temperature during at least a majority of an entire time period in which the charge is applied to the battery, **wherein, at least when the charge is initially applied to the battery, the particular amount of the charge is 10A or greater**.

Independent claims 15 and 29 relate to a related process and a storage medium, respectively, and recite similar subject matter, i.e., *inter alia*, **at least when the charge is initially applied to the battery, the particular amount of the charge is 10A or greater**.

It is respectfully asserted that the alleged combination of the Notten Patent and the Sakakibara Patent fails to teach or suggest a battery charger configured to provide a temperature-regulated charging of a battery, or a related process or storage medium, in which, **at least when the charge is initially applied to the battery, the particular amount of the charge is 10A or greater**, as recited in amended independent claims 1, 15 and 29 of the above referenced application, respectively.

In the present Office Action, the Examiner acknowledges that the Notten Patent does not disclose that the charging initially applied to the battery is 6.5A or greater, much less 10A or greater, and states that the Sakakibara Patent allegedly discloses a battery charger and charging

method wherein the initial charging current applied is 6.5A or greater. (See, e.g. latest Office Action, p. 4). However, the Sakakibara Patent clearly does not teach or suggest that, at least when the charge is initially applied to the battery, the particular amount of the charge is **10A or greater**, as recited in amended independent claims 1, 15 and 29 of the above referenced application.

As discussed above, The Sakakibara Patent provides that, under certain conditions, "region I12 is selected and relatively high current of 4.5C, charging current (9A) is applied." (Sakakibara Patent, col. 8, lns. 5-10). With reference to the map illustrated in Fig. 5 of the Sakakibara Patent, a region I12 is in the upper left on such map, where a relatively high charging current is applied. (See *id.* at col. 5, lns. 14-31, and Fig. 5). Indeed, such region I12 is the region in which the highest current would be applied according to the Sakakibara Patent because it is "desirable to set a low current value on the left column on the map in order to avoid performance deterioration" since battery performance deteriorates if high current is discharged at low temperature. (See *id.* at col. 5, lns. 32-35, and Fig. 5).

This description is further supported by Fig. 6 of the Sakakibara Patent, which shows the relatively high current of 4.5C as being the highest current applied. Moreover, the charging current vertical axis of the graph shown in Fig. 6 of the Sakakibara Patent does not show any axis values higher than 4C. Rather, the Sakakibara Patent relies on where the highest applied current shown in Fig. 6 intersects the charging current vertical axis (i.e. above 4) and the corresponding text of the specification as showing an applied current of 4.5C. (See, e.g. *id.* at col. 8, lns. 8-10, and Fig. 6). Accordingly, not only does the Sakakibara Patent fail to teach, suggest or disclose an initial charge of 10A or greater, the Sakakibara Patent rather would discourage one skilled in the art at the time the present invention was made from using an initial charging current greater than 9A (i.e.,

teaches away from Applicants' claimed invention), which the Sakakibara Patent states and shows as being the relatively high current value (see, e.g. *id.* at col. 8, lns. 5-10, and Figs. 5 and 6). Indeed, the Sakakibara Patent states that "[t]he map is provided for variable-control of current and for specifying an optimum value of current which can be applied in order to avoid overheating battery." *Id.*, col. 5, lns. 14-16. Thus, one skilled in the art using the map provided in Sakakibara Patent would be discouraged from using an applying an initial charging current of 10A or greater.

Moreover, contrary to the Examiner's contention on p. 4 of the latest Office Action, alleging an optimum initial charging current for acceptable temperature rise would require undue experimentation, even when the Sakakibara Patent is used in combination with Norton, especially because the Sakakibara Patent does not teach, suggest or disclose a charge initially applied to a battery of 10A or greater, as recited in amended independent claims 1, 15 and 29 of the above referenced application.

The court in *In re Boesch* affirmed the Patent Board's decision affirming an examiner's determination that it was obvious to one skilled in the art to identify an optimum composition for alloys where that optimum value was within a range already disclosed in the prior art. 617 F.2d 272, 275-76 (CCPA 1980). Of great importance in *In re Boesch*, was the fact that a range covering the claimed composition had already been disclosed in the art. Conversely, the present application describes using an initial current which is not within a range disclosed in prior art recited by the Examiner and in fact outside of the disclosed range. Indeed, as recited in claims 1, 15 and 29, the particular charge is **10A or greater when the charge is initially applied to the battery**. Neither the Notten Patent nor the Sakakibara Patent teach or suggest a use of any range which includes a charge of 10A or higher or any charge range including 10A or higher. Therefore, the

holding in *In re Boesch* is not a proper precedent to apply for a rejection under Section 103(a) for the amended independent claims 1, 15 and 29.

Further, it is respectfully asserted that at the time of the filing of the present application, it would not have been obvious to one skilled in the art to apply an initial charge of 10A to the battery described in the Notten Patent. Neither the Notten Patent nor any patent relied on by the Examiner teaches, suggest or discloses at least initially charging a battery with a particular initial charge of **10A or greater**, as recited in amended independent claims 1, 15 and 29 of the present application.

Accordingly, for at least the reasons described above, Applicant respectfully asserts that the alleged combination of the Notten Patent and the Sakakibara Patent does not teach or suggest **the battery is maintained at a predetermined threshold temperature during at least a majority of an entire time period in which the charge is applied to the battery, and at least when the charge is initially applied to the battery, the particular amount of the charge is 10A or greater**, as recited in amended independent claims 1, 15 and 29 of the above referenced application. The Farley Patent, the Podrazhanzky Patent and the Yagi Patent do not cure at least these deficiencies of the Notten Patent, and the Examiner does not contend that they do.

Therefore, Applicant respectfully submits that the alleged combination of the Notten Patent and the Sakakibara Patent, even if combined with the Farley Patent, the Podrazhanzky Patent or the Yagi Patent, fails to teach or suggest the subject matter recited in amended independent claims 1, 15 and 29. The claims which depend from these independent claims are also believed to be allowable over the Notten, Sakakibara, Farley, Podrazhanzky and Yagi Patents for at least the same reasons as set forth herein above with respect to amended independent claims 1, 15 and 29.

Thus, for at least these reasons, the 35 U.S.C. § 103(a) rejection of amended independent claims 1, 15 and 29, and the § 103(a) rejections of the claims which depend therefrom, should be withdrawn. In addition, it is believed that the claims which depend from independent claims 1, 15 and 29 are also allowable over the alleged combination of the Notten, Sakakibara, Farley, Podrazhanzky and Yagi Patents for at least the same reasons, as well as contain separate patentably distinct subject matter.

III. CONCLUSION

In light of the foregoing, Applicant respectfully submits that all pending claims 1-9, 11-23, 25-37, 39-48 and 52-54 are in condition for allowance. Prompt consideration, reconsideration and allowance of the present application are therefore earnestly solicited.

Respectfully submitted,

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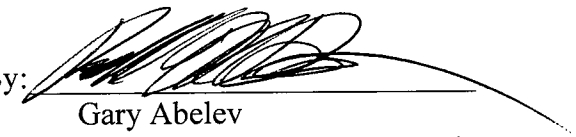
By: 

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